

## SOUND TRANSIT FIGHTS CONGESTION – ON THE STREETS AND ACROSS THEIR WAN



### BACKGROUND – SOUND TRANSIT

Sound Transit was created by voters in 1996 to plan, build and operate a mass transit system to fight traffic congestion and its impact on the economy, environment, and quality of life in Central Puget Sound. Today, the agency runs 19 express bus routes, 74 miles of commuter train service and light rail in Tacoma. In addition, Sound Transit is building a 15-mile light rail line from downtown Seattle to Sea-Tac International Airport, as well as park-and-ride lots, transit centers, and HOV access lanes throughout the region.

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— GARV NAYYAR, SENIOR INTEGRATION ENGINEER

Sound Transit’s building program invests over \$600 million in construction projects per year. These projects require close coordination between hundreds of employees spread throughout offices in the Seattle region. Over half of Sound Transit’s employees are consultants and outside contractors, making

it particularly difficult to share information in a secure manner. To address this application delivery challenge, the Sound Transit IT department made a strategic decision to centralize all key applications, including Microsoft SharePoint for file sharing, Opentext Livelink ECM for document management, Primavera Expedition for project management, and Microsoft Exchange for e-mail. In addition, the entire organization turned to Cisco Voice over IP (VoIP) as a critical way of keeping telephony expenses down throughout the organization’s distributed facilities.

By centralizing servers and storage, the IT department could better control access to critical information, including tenders, photos, and workflow documents. However, there was also a downside — Sound Transit’s WAN was struggling under the sheer volume of data being generated. This caused application performance to suffer.

“Our WAN was regularly experiencing 80–90% saturation as workers shared CAD drawings, construction photos, and other large documents with one another,” said Garv Nayyar, Senior Integration Engineer. “It was taking excessively long periods of time to upload and download routine files, which made it increasingly difficult to collaborate on time-sensitive construction projects.”

High-resolution construction site photos, for example, typically average 4 MB in size. It took several minutes to share these files across a T1 link. Furthermore, the performance of Sound Transit’s VoIP network was severely degraded as voice calls were competing with other traffic. End users could notice a drop in voice quality as large file transfers were taking place.

Customer: SOUND TRANSIT



### Quick Sound Transit Facts

- Created by voters in 1996 to build and operate the regional mass transit system in the Seattle area
- Hundreds of employees, consultants, and contractors spread throughout the region
- Centralized file services, document management, project management, and e-mail
- 100% VoIP for telephony services
- 80–90% WAN saturation causing poor application performance

### Silver peaks Results

- Up to 20x improvements in file transfers
- Average WAN latency reduced to less than 100 ms, improving VoIP quality
- End-to-end QoS, including traffic shaping and bandwidth management
- Saved approximately \$100,000 in recurring WAN costs

## THE ROAD TO ACCELERATION

Sound Transit quickly realized that bandwidth was not the only factor hampering their WAN performance.

“One of our branch offices had twice the WAN capacity of the others, yet still had the same application performance challenges,” said Nayyar. “Without quantifiable improvements, we could not justify spending an additional \$100,000/year in WAN expenditures to upgrade the rest of our facilities.”

Compression products from Packeteer yielded similar results. Sound Transit saw a small improvement in bandwidth capacity (approximately 50%), but this had a limited impact on application response time.

Sound Transit also looked at Riverbed’s Steelhead appliances. But, they quickly realized that Riverbed’s TCP-only solution could not satisfy their VoIP needs.

“We wanted to do more for our voice traffic than simply make more room for it,” said Nayyar. “At the very minimum, we needed a solution that could prioritize this traffic and allocate bandwidth accordingly.”

Sound Transit worked with a local partner to analyze the alternatives. Ultimately, it decided to evaluate Silver Peak’s NX series appliances, based upon the following capabilities:

- **Data reduction.** The Silver Peak solution uses data reduction to deliver significantly more WAN capacity than traditional compression solutions. With this technology, Silver Peak can eliminate over 99% of WAN traffic under certain circumstances — well beyond the 3–4x improvements seen with Packeteer.
- **Latency/Loss mitigation.** Silver Peak leverages a variety of tools to overcome latency and loss across the WAN. Sound Transit was convinced that these were essential to overcoming their poor application performance.

- **Security.** As a government agency, Sound Transit has well defined policies for data security. To comply with these policies, the organization requires data encryption — both across the WAN and on their WAN acceleration appliances. The Silver Peak solution offers a 128-bit solution with hardware encryption that enables secure data transfer with no impact on performance. In addition, Silver Peak is the only WAN acceleration solution to encrypt data stored on local hard drives.
- **QoS.** Sound Transit requires a WAN acceleration solution that could interact with their existing QoS schemes to ensure end-to-end bandwidth enforcement and traffic prioritization.
- **Application breadth.** Sound Transit has numerous applications running across their WAN, from file and web to document management and project management. Because the organization is 100% dependent on VoIP for telephony services, about one-third of Sound Transit’s WAN traffic does not use the TCP protocol, Silver Peak is the only WAN acceleration solution to work across both TCP and UDP applications, creating a unique advantage in the Sound Transit environment.

## RESULTS

In the first phase of their deployment, Sound Transit deployed Silver Peak NX appliances in several facilities throughout the Puget Sound region.

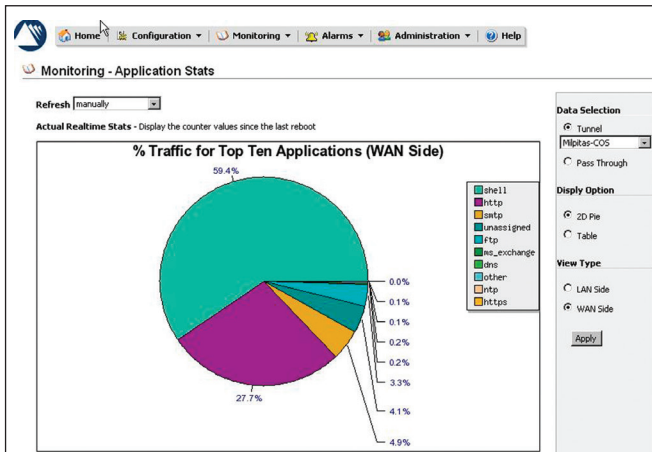
“The difference was like night and day”, said Nayyar. With Silver Peak, Sound Transit routinely saw a 10–20x improvement in file sharing, with 6 MB files being downloaded in only 5 seconds. WAN capacity increased by 95%. In addition, average WAN latency was reduced to under 100 milliseconds, creating a noticeable improvement in VoIP quality.

“Aside from one user who jokingly complained that she could no longer make a cup of coffee while waiting for her CAD files to upload, the response was overwhelmingly positive,” joked Nayyar.

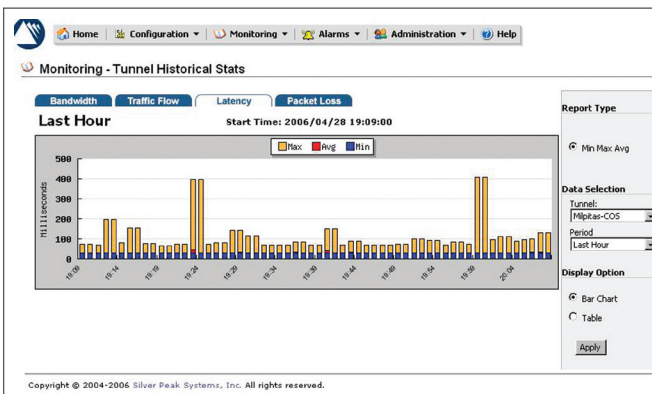
Silver Peak worked with Sound Transit to implement a QoS scheme that involved traffic shaping and bandwidth management for VoIP and other business applications. This was done within the Silver Peak appliances and in conjunction with the QoS capabilities within Sound Transit’s WAN routers.

“By simplifying our ability to configure and deploy advanced QoS policies, the product basically paid for itself,” said Nayyar. “End-to-end QoS was essential for making our key applications perform like they were local.”

Sound Transit is devoted to fighting congestion — on the streets and across their WAN. To support its ambitious construction plans, the agency found a reliable partner in Silver Peak



Sound Transit chose Silver Peak to accelerate a variety of applications across their WAN



Silver Peak reduced average WAN latency to less than 100 ms